Aviation Weather Information

Future Plans

NASA Aviation Safety Program

Weather Accident Prevention Project Review

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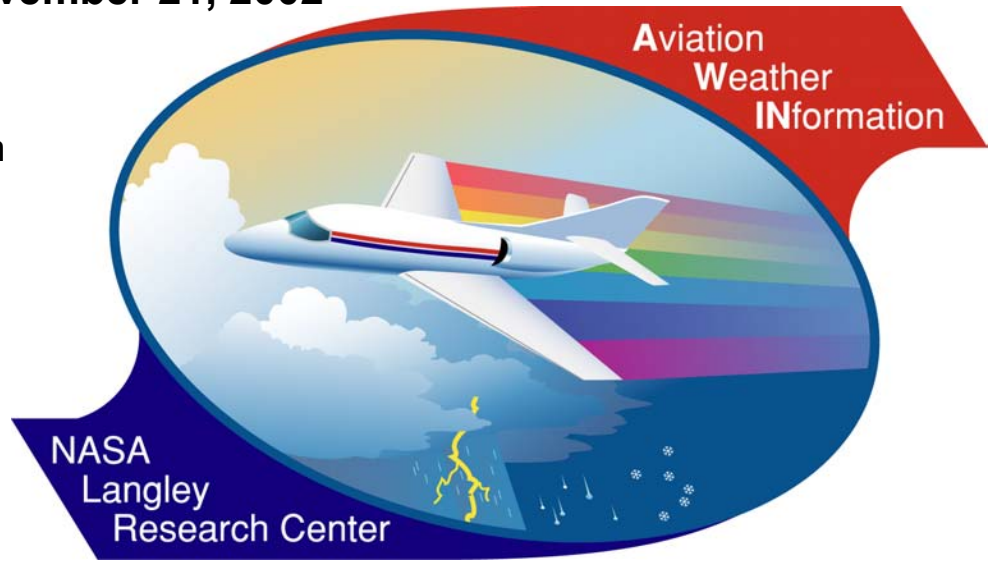


Outline

- Timeline
- Needs
- Plans

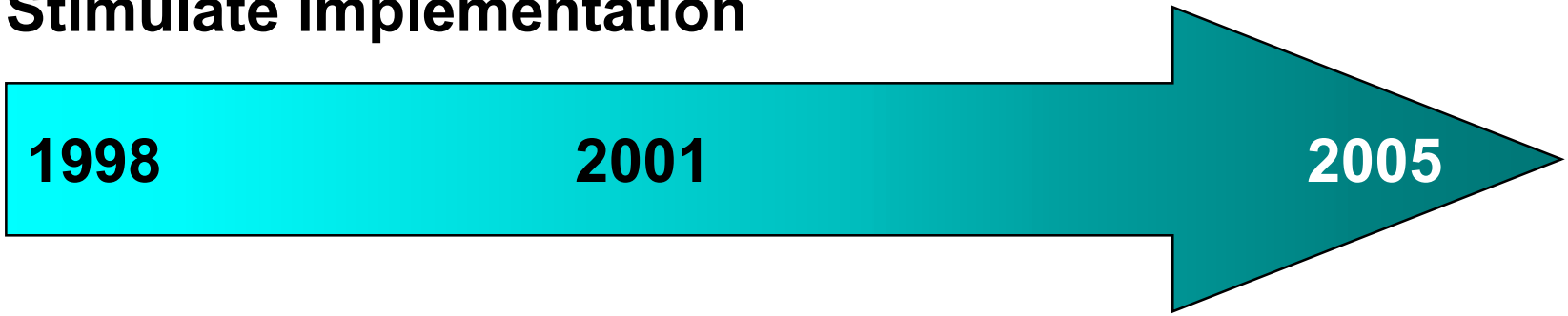
Technology Development

Aviation Weather Information

Weather Channel in the Cockpit

Implementation Catalyst

- **Develop viable 1st generation systems**
- **Stimulate implementation**



Information; Not Data

Next generation technologies

- **Data fusion**
- **Alerting and decision aiding**

AWIN Needs

- **Expand in situ weather measurement capability**
  - **Provide soundings at other than major airports**
  - **Provide data at lower altitudes**
  - **Provide moisture data**

- **Expand use of satellite weather observations**
  - **Incorporate more data from current weather satellites into aviation products**
  - **Provide coverage of oceans and remote areas**
  - **Incorporate high resolution soundings from next-generation satellites**
  - **Improve short-term forecasts**

AWIN Needs

- Combine diverse weather data sources
  - Combine onboard and datalink sources
  - Account for variations in spatial resolution or coverage
  - Account for variations in time of observations or forecasts
  - Relate to route of airplane
- Provide same weather sources and information for air side and ground side
  - Foster collaboration
  - Address different platforms

AWIN Needs

- **Insure that pilots can use the full capabilities of the system**
  - **Make it right before it is entrenched**
- **Prevent workload increase**
  - **Turn data into information**
  - **Create decision-based products**
  - **Look at the system in the context of everything else in the cockpit**
  - **Avoid creating new types of accidents due to operational shortcomings**

AWIN Needs

- **Establish cross-industry standardization of use of color and symbology**
  - **Not the role of an individual company**
  - **Needed for disparate types of information (terrain, airspace, etc.)**
- **Provide FAA information for regulations and guidance materials**
  - **Certification issues may deter things that would be beneficial**
  - **With no data, everybody's opinion is equally valid**
  - **Standards should be intentional, not just reflect what was done**
  - **Procedures for use are needed**
  - **Research identifies areas where better training is needed**

AWIN Needs

- **Reduce risk for providing advanced tools**
  - **Go beyond readily available "easy" products**
  - **Link airplane and pilot capabilities to the decision**
  - **Consider ATC imposed restrictions in decision support**

Future Plans

Develop Needed Weather Products and Sensing Capabilities

- Information fusion – combine data from diverse sources to synthesize information required to generate displays
- TAMDAR - automated airborne weather reporting
- ASAP - satellite observations and soundings to improve weather reports and forecasts

Future Plans

Develop Enhanced Weather Presentations and Decision Aids

- Advanced information portrayal
  - Colors and symbols
  - Route-specific
  - Vertical extent
  - Collaborative use
- Alerting and decision aiding
  - Hazardous weather thresholds
  - Reliability of information
- Use of strategic information with tactical information
- Lessons from operational experience with AWIN systems

Summary

Two Areas of Emphasis

- Weather Products and Sensing Capabilities
- Enhanced Weather Presentations and Decision Aids

Milestones

- 2003 Flight evaluation of AHAS with cockpit display
- 2004 Operational evaluation of TAMDAR
- 2004 Next generation presentation/aiding guidelines
- 2005 Flight demonstration of next generation technologies